DOCUMENT RESUME

ED 227 147 TM 830 154

AUTHOR Claus, Richard N.; Girrbach, Charmaine J.
TITLE Long-Term Sustained Effects of Chapter I Participation, 1979-1982.
INSTITUTION Saginaw Public Schools, Mich. Dept. of Evaluation Services.
PUB DATE Dec 82
NOTE 26p.; Contains occasional light type.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; *Compensatory Education; *Educationally Disadvantaged; Grade 3; Longitudinal Studies; *Mathematics; Pretests Posttests; Primary Education; Program Effectiveness; *Reading
IDENTIFIERS California Achievement Tests; Education Consolidation and Improvement Act 1981; *Education Consolidation Improvement Act Chapter 1; Elementary Secondary Education Act Title I; Michigan (Saginaw); Supplemental Teache Participation (Saginaw MI)

ABSTRACT

The long-term sustained impact of the Saginaw School District Chapter I Supplemental Teacher Participation (STP) program on third grade students during the 1979-80 school year was examined. A total of 256 students were classified into one of four categories: 1 year, 2 year continuous, 3 year continuous, and 2 year interrupted. Two different standards were used to gauge observed growth of groups in each category. The first required growth equal to or exceeding normal growth or, in other words, sustaining normal growth levels or exceeding them. All four category groups exceeded the standard of "normal growth" in both academic areas except for the 2 year interrupted group in mathematics. The second standard required growth equaling or exceeding the growth of the 3 year continuous STP group. The three other groups failed this standard in both subjects with the exception of the 2 year continuous group in mathematics. It was found that the academic achievement of Saginaw's compensatory education population is associated positively with the amount of continuous time spent in the Chapter I STP program. (Author/PN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED227147

EVALUATION REPORT

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

R. N. Clans

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

DEPARTMENT OF EVALUATION SERVICES

- PROVIDING ASSESSMENT, PROGRAM EVALUATION AND RESEARCH SERVICES -

Saginaw Public Schools

Saginaw, Michigan

TM 830 157

LONG-TERM SUSTAINED EFFECTS OF CHAPTER I PARTICIPATION

1979-1982

An Approved Report of the

DIVISION OF ADMINISTRATION AND PERSONNEL

Department of Evaluation, Testing and Research

Richard N. Claus, Manager
Program Evaluation

Barry E. Quimper, Director
Evaluation, Testing & Research

Charmaine J. Girrbach
Research/Evaluation Specialist

Dr. Foster B. Gibbs, Superintendent and
Dr. Jerry R. Baker, Assistant Superintendent
for Administration and Personnel
School District of the City of Saginaw

December, 1982

TABLE OF CONTENTS

	Page
INTRODUCTION	1
STUDY DESIGN	4
PRESENTATION OF DATA	7
"Normal Growth" Criterion Results	7
NCE Gain Criterion	9
DISCUSSION	13
SUMMARY AND CONCLUSIONS	17
RECOMMENDATIONS	19
BIBLIOGRAPHY	21

LIST OF TABLES

Table		Page
1	Comparison of Category Group Growth to Normal Growth	7
2	Gain (in NCE) of Continuing Compensatory Education Group by Category--Reading	10
3	Gain (in NCE) of Continuing Compensatory Education Group by Category--Mathematics	11

INTRODUCTION

This study was designed to achieve two primary goals. The first goal was to evaluate the long-term sustained impact of the Chapter I Compensatory Education Program operated by the School District of the City of Saginaw on both former participating pupils and pupils who continued to participate because of low achievement. A second goal was to meet an evaluation requirement of Chapter I of the Education Consolidation and Improvement Act (ECIA) of 1981 which required that once every three years since the 1978-79 school year a determination be made whether improved performance is sustained over a period of more than one year from programs funded under this act.[1]

The Saginaw program funded under Chapter I is entitled Supplemental Teacher Participation (STP). The purpose of this program is to improve the reading and mathematics achievement of a designated number of educationally disadvantaged students. The Chapter I funded STP program served approximately 2,000+ students in grades K-7 each of the three years since 1979.[2]

Both product and process evaluations of the program have been conducted for the past three years. The product evaluation reports describe the academic achievement of STP students fully and are available upon request from the Department of Evaluation, Testing and Research. Grade level achievement of the performance standard in both subject areas are summarized in the chart below for the three school years of interest.

---

[1]The funding legislation was originally known as Title I of the Elementary and Secondary Education Act of 1965.

[2]Eighth grade students were also served during the 1981-82 school year.

Overall Record of STP Program Attainment from 1979 to 1982

Grade	Subject	Attainment of Performance Standard[1] 1979-80	1980-81	1981-82
K	Reading	Yes	No	Yes
	Mathematics	Yes	No	Yes
1	Reading	Yes	Yes	Yes
	Mathematics	Yes	Yes	Yes
2	Reading	Yes	Yes	Yes
	Mathematics	Yes	Yes	Yes
3	Reading	Yes	No	No
	Mathematics	Yes	No	No
4	Reading	Yes	Yes	Yes
	Mathematics	Yes	Yes	Yes
5	Reading	Yes	No	Yes
	Mathematics	Yes	Yes	Yes
6	Reading	Yes	Yes	Yes
	Mathematics	Yes	Yes	Yes
7	Reading	Yes	No	No
	Mathematics	Yes	No	No
8	Reading	---	---	Yes
	Mathematics	---	---	Yes
Summary of Performance Standard Attainment		16-Yes (100.0%) 0-No (0.0%)	9-Yes (56.2%) 7-No (43.8%)	14-Yes (77.8%) 4-No (22.2%)

Overall, the achievement levels in the attainment of the performance standard for the STP program have been very positive.[2] Achievement of the performance standard was the best during 1979-80 with 100% positive attainment followed by 1981-82 with 77.8% positive attainment, and 1980-81 with 56.2% positive attainment. Student achievement levels for reading and mathematics seemed quite similar in terms of attaining the performance standard over the three year period.

---

[1]Attainment of performance standard is defined as an improvement of the mean post-test percentile score over mean pre-test percentile score.

[2]Mullin and Summers (1983) have just completed a study of all the "major" compensatory education studies. Generally their review indicated that compensatory education programs have a positive though small effect on the achievement of disadvantaged students. Our findings locally showed much larger positive gains (at or above "normal growth") across the majority of grade levels.

It is in this context that the Department of Evaluation, Testing, and Research has attempted to implement an investigation into the sustained effectiveness of its Chapter I STP program on participants who obtained differential lengths of service from the STP program.

STUDY DESIGN

The third graders in the Chapter I STP program during the 1979-80 program were chosen as the subjects for the study. The choice was made for the following reasons: 1) test data on the majority of students would exist at the end of the three year period because district-wide testing occurs both in the spring of third and fifth grades, 2) third grade is typically where accumulative academic deficits seem to become more pronounced, and 3) an adequate number of participants at this grade level seemed to exist to allow for meaningful comparisons of participation with varying lengths of STP service. The decision to save data for this longitudinal study was made during the 1979-80 school year but the grade level selected and the exact nature of the study was not finalized until the Fall of 1982.

The problem addressed by the study was to determine if the Chapter I STP program made a long-term sustained impact in terms of reading and mathematics achievement as measured by the California Achievement Tests (CAT). Two different standards were used as criterion to determine the presence or absence of a long-term sustained effect. The first criterion was "normal growth" (Echternacht, 1980). Normal growth is defined as an estimate of how well students will perform in the absence of any special program. The use of the concept of "normal growth" requires, in this context, a pre-test measure of all district third grade students. Spring, 1980 CAT results served as the pre-test and Spring, 1982 CAT test results served as the post-test when the concept of "normal growth" was employed to determine the percent of gain beyond "normal growth". This additional growth in comparison to "normal growth" is one standard chosen as a measure of sustained effect.

The second criterion chosen was a normal curve equivalent (NCE) score gain equal to or greater than the gain of third grade pupils who were in the STP program from the Fall, 1979 through Spring, 1982 as fifth graders. Participants in the STP program had to have pre-test scores at or below the 44 NCE to remain eligible for each of the three years. The three year STP participants were pre-tested (Fall, 1979) and finally post-tested (Spring, 1982) on CAT. The average gain of this group of continuing STP participants served as the second criterion against which the results for the other groups were compared.

The results of four different levels of STP participation were under study from the original group of 1979-80 third grade STP participants who were pre- and post-tested during that school year (N = 335). The four possible levels of participation and additional CAT testing points are described below:

Categories of Participation

- Category 0--During the two year period from Spring, 1980 to Spring, 1982 these pupils no longer participated in the STP program but were tested in the Spring, 1982 (district-wide fifth grade testing).

- Category 1--During the one year period from Spring, 1980 to Spring, 1981 these pupils continued to participate in the STP program (tested Spring, 1981) and from Spring, 1981 to Spring, 1982 these pupils no longer participated in the STP program but were tested in the Spring, 1982 (district-wide fifth grade testing).

- Category 2--During the two year period from Spring, 1980 to Spring, 1982 these pupils participated in the STP program and were tested the Springs of 1981 and 1982.

- Category 3--During the one year period from Spring, 1980 to Spring, 1981 these pupils no longer participated in the STP program (tested Spring, 1981 as potential STP participants) and from Spring, 1981 to Spring, 1982 these pupils were readmitted because of low scores for participation in the STP program and were tested again in Spring, 1982.

These four levels of participation are fundamental to the statement of the study hypotheses. The study hypotheses stated below are grouped according to the criterion categories discussed earlier.

Hypotheses: Normal Growth

1. There will be growth equal to or exceeding "normal growth" in reading and mathematics as measured by CAT for the category 0 pupils (one year STP participation).[1]

2. There will be growth equal to or exceeding "normal growth" in reading and mathematics as measured by CAT for the category 1 pupils (two years continuous STP participation).

3. There will be growth equal to or exceeding "normal growth" in reading and mathematics as measured by CAT for the category 2 pupils (three years continuous STP participation).

4. There will be growth equal to or exceeding "normal growth" in reading and mathematics as measured by CAT for the category 3 pupils (two year interrupted STP participation).

Hypotheses: NCE Gains

1. There will be growth equal to or exceeding category 2 students in reading and mathematics as measured by CAT for the category 0 pupils (one year STP participants).

2. There will be growth equal to or exceeding category 2 students in reading and mathematics as measured by CAT for the category 1 pupils (two year continuous STP participation).

3. There will be growth equal to or exceeding category 2 students in reading and mathematics as measured by CAT for the category 3 pupils (two year interrupted STP participation).

---

[1]Each instance where a length of participation is stated it is meant that the pupil had at least that number of school years of participation from Fall 1979 to Spring 1982. They possibly could have had additional years of participation prior to Fall 1979. For the interest of convenience, years of possible participation for the scope of this study will range from one to three. Recommendations to enlarge the longitudinal nature of future studies are given at the end of this study.

PRESENTATION OF DATA

What follows is a presentation of the data contrasting the four category groups according to two growth standards. The first criterion used to contrast growth levels is "normal growth". The other criterion employed is NCE gains of the three year continuous STP group (category 2).

"Normal Growth" Criterion Results

Table 1 below compares Chapter I results in reading and math with normal growth by category. The term "normal growth" is an index which standardizes the scores for an entire grade level, thereby allowing comparisons with any subgroup of interest. These data incorporate a time span of Spring, 1980 to Spring, 1982.

TABLE 1. COMPARISON OF CATEGORY GROUP GROWTH TO NORMAL GROWTH.

	Category				
	0 (N=81)	1 (N=21)	2 (N=139)	3 (N=15)	District (N=1,222)
Reading					
Normal Growth	25.8	25.8	25.8	25.8	25.8
Category Group Growth	29.8	30.8	31.8	27.8	31.8
% Additional Growth	15.5	19.4	23.3	7.8	23.3
Math					
Normal Growth	37.3	37.3	37.3	37.3	37.3
Category Group Growth	38.3	40.3	41.3	33.3	43.3
% Additional Growth	2.7	8.0	10.7	-10.7	16.1

As indicated in Table 1, normal growth for third grade reading attained a value of 25.8 NCE's. Using this number as our baseline, category 0 (those students having had the least amount of compensatory education instruction) showed a growth of 29.8 NCE, or 15.5% better than normal growth. Category 1 (those students with approximately two years of continuous compensatory education instruction) had a growth of 30.8 NCE or 19.4% better than normal growth. Category 2 (those students who have received compensatory education instruction during the entire three year span) achieved a growth of 31.8 NCE or 23.3% better than normal growth. Category 3 (those students who had approximately two years of interrupted compensatory education instruction) showed a growth of 27.8 NCE or 7.8% better than normal growth. The district-wide growth result for this same time period was 31.8 NCE or 23.3% better than normal growth.

Table 1 also presents the same information by category for mathematics. Again, normal growth is the standard for comparison. Normal growth had a value of 37.3 NCE over this three year span. Category 0 achieved a growth of 38.3 NCE or 2.7% greater than normal growth. Category 1 showed a growth of 40.3 NCE or 8.0% greater than normal growth. Category 2 showed a growth value of 41.3 NCE or 10.7% greater than the baseline value of 37.3 NCE. Category 3 had a growth value of 33.3 NCE or 10.7% less than normal growth. The district-wide growth value was 43.3 NCE or 16.1% greater than normal growth.

A review of the preceding information lays the foundation for the belief that academic achievement of Saginaw's compensatory education population is positively associated with the amount of continuous time spent in the Chapter I STP program. For categories 0, 1 and 2 where instruction was provided for one, two or three years without a break, the growth was equal to or greater than that of normal growth in both reading and mathematics. Only in

category 3 where compensatory education services were not continuous did the pattern waver, with reading exceeding normal growth and mathematics falling short of the standard.

The following chart designates which category group(s) grew at a rate equal to or exceeding that of normal growth for reading and mathematics. The chart also relates these questions back to the hypotheses stated earlier concerning the normal growth standard.

Category Group	Results Which Equal or Exceed Normal Growth		Relates to Hypothesis:
	Reading	Math	
0	Yes	Yes	1
1	Yes	Yes	2
2	Yes	Yes	3
3	Yes	No	4

As the chart indicates, all categories were able to equal or exceed normal growth in reading and all but one category in mathematics achieved this goal. Now, the gains of category groups 0, 1, and 3 are contrasted with the NCE gain criterion of category 2 (the three year continuous STP group).

NCE Gain Criterion

As NCE gains are used by the state and federal government as the primary way to report annual Chapter I results, it would seem that such a measurement of academic growth is also viable for this study. Tables 2 and 3 below present another way to denote achievement gains by the compensatory education groups, using NCE gains by category for different time periods for both reading and mathematics. Table 2 below presents the reading gains over the three year period of study as well as at periodic bench marks.

TABLE 2. GAIN (IN NCE) OF CONTINUING COMPENSATORY EDUCATION GROUP BY CATEGORY--READING.

Time Span	Category 0	1	2	3
Fall, 1979 to Spring, 1980	5	5	6	6
Spring, 1980 to Spring, 1981	--	4	2	-5
Spring, 1981 to Spring, 1982	--	1	4	7
Spring, 1980 to Spring, 1982	4	--	--	--
Total Net Gain	9	10	12	8

Category 0 showed a gain of 5 NCE's over the 1979-80 school year while participating in the Chapter I program. After leaving the program they were not tested again until Spring, 1982 as fifth graders where they showed a gain of 4 NCE's. Therefore, over the three year period a total net gain of 9 NCE was made. Category 1, participants in Chapter I for two consecutive years, had gains of 5 NCE the first year and 4 NCE the second. As fifth graders, they did not participate in compensatory education but were tested in the Spring, 1982 as part of whole grade testing. The gain at that time was 1 NCE, thereby giving a total net gain of 10 NCE. Category 2, having been in the Chapter I program for three consecutive years, yielded gains of 6, 2 and 4 NCE for each of the testing points. Overall, category 2 showed a total net gain of 12 NCE. Category 3, those whose participation had been two non-continuous years, showed an initial gain of 6 NCE for the first year in the program. The next testing (Spring, 1980 to Spring, 1981) showed a loss of 5 NCE for these same students. The reader should remember that this group did not receive STP Chapter I help during the 1980-81 school year but were tested in the Spring of 1981 as potential compensatory education

students for the next school year. The 1981-82 school year found them back in the Chapter I program and their spring test scores for that school year indicated a gain of 7 NCE. Overall, this group showed a total net gain of 8 NCE.

The mathematics results are presented in Table 3 below. The total net gain in NCE's of category group 2 again served as the criterion.

TABLE 3. GAIN (IN NCE) OF CONTINUING COMPENSATORY EDUCATION GROUP BY CATEGORY--MATHEMATICS.

Time Span	Category			
	0	1	2	3
Fall, 1979 to Spring, 1980	11	15	9	10
Spring, 1980 to Spring, 1981	--	0	0	- 8
Spring, 1981 to Spring, 1982	--	3	4	4
Spring, 1980 to Spring, 1982	1	--	--	--
Total Net Gain	12	18	13	6

Category 0 showed a gain of 11 NCE's over the 1979-80 school year during which they participated in Chapter I. Although no longer participating in compensatory education after 1979-80; the students showed a gain of 1 NCE from the Spring, 1982 whole grade testing, giving a total net gain of 12 NCE for this group. Category 1 showed a gain of 15 NCE during the first year of compensatory education participation but no gain the second year. As part of whole grade testing in Spring, 1982, this group (no longer Chapter I participants) showed a gain of 3 NCE. Category 1 had a total net gain of 18 NCE over the three year period. Category 2, those who continued in Chapter I for the entire three years, had a gain of 9 NCE the first year, no gain the

second year, and a gain of 4 NCE the third year, for a total net gain of 13 NCE over the three year period. Category 3 had a gain of 10 NCE the first year of the program, a loss of 8 NCE during the non-participation year of 1980-81, and a gain of 4 NCE for the next Chapter I segment during the 1981-82 school year. Overall category 3 had a total net gain of 6 NCE.

The following chart summarizes which category group(s) grew at a rate equal to or exceeding group 2 (those students who have received compensatory education instruction during the entire three year span) for reading and mathematics. The chart also relates these questions back to the hypotheses stated earlier.

Category Group	Results Which Equal or Exceed Gains of Category Group 2		Relates to Hypothesis:
	Reading	Math	
0	No	No	1
1	No	Yes	2
3	No	No	3

As indicated above, only category group 1 participants in mathematics were able to equal or exceed gains of category group 2 participants and none of the three groups achieved this goal in reading. In an attempt to bring all the information together and bring closure, a discussion section follows.

DISCUSSION

The data presented on the preceding pages provided two standards used for comparison of the sustained effects of Chapter I participation. What follows is an attempt to analyze some of the data presented earlier.

Chapter I students have demonstrated an academic deficit in reading and/or mathematics. Participation in the program is provided to students who score at or below the 44 NCE on CAT. Since standardized testing provides the district with a means to identify potential students, the use of test results should be considered as a source of information to document long-term effectiveness. As eligibility is reassessed each year, those who remain eligible continue to exhibit the greatest need. Consequently, category 2 participants (those students who remain in Chapter I programs) do show a constant lower level of absolute achievement in comparison to other categories. The expectation might then be, that these students would also show smaller increments of growth. However, it can be seen (see Table 1) that Chapter I participants show the greatest percentage of growth[1] in comparison to the other STP groups studied the longer they remain in the program without interruption. The data in Table 1 indicate any presumption that academically disadvantaged children placed in compensatory education programs grow at lower rates than normal may be erroneous. Succinctly stated, our present expectation is that Chapter I participants experience greater gains the longer they continuously participate in the STP program.

---

[1]The authors acknowledge that a small amount of net gain (0.5 NCE or less) reported by the various groups may be due to the regression effect (Roberts; 1980, pp. 78-80). However, the magnitude of the error is relatively small so that resultant gains still reflect a positive effect of STP program participation. Linn (1980) and Burton (1980) address the regression effect topic in greater detail for the interested reader.

This new expectation could lead to another related hypothesis concerning the growth of participants who experienced interrupted programming (category 3). This hypothesis would hold that the gains of category 3 participants would be the smallest of any of the groups. Category 3 participants had the smallest percentage of additional growth in reading and exhibited a loss in terms of growth in mathematics. A review of Tables 2 and 3 reveals that students whose Chapter I eligibility and service is interrupted show a loss of 4 NCE in reading and 8 NCE in mathematics during the non-participatory year.[1] No other category demonstrated this phenomenon at any other testing point. Two possible explanations for this are: 1) students failed to consolidate learnings into their long-term memory and these short-term learnings were lost (failures to internalize learnings) or, 2) students obtained high scores not solely because of what they learned but because of testing abnormalities that caused their scores to be systematically in error in a positive direction, i.e., false positives. Additional testing a year later along with teacher observations of lower performance substantiated that these students could not display their higher levels of achievement due to either inability to internalize learnings or lack of other testing abnormalities to again raise scores.

It was observed that initial NCE gains (Fall, 1979-Spring, 1980) were greater than the gains experienced over the next two years. An examination of Tables 2 and 3 reveal that subsequent NCE gains in reading and mathematics for categories 0, 1 and 2 following the initial year (1979-80) of Chapter I participation never exceeded the initial gains. Possible explanations for

---

[1]The reader should also note that only 15 of the 256 students (5.8%) in the study were in the interrupted participation category. This may have been too small a number to support a solid finding.

this occurence may be one or a combination of the following: 1) compensatory education gains are typically greater on a fall-to-spring rather than on a spring-to-spring testing cycle because of the possibility that a) students experience an "achievement loss" and that skills are "forgotten" during the summer and/or, b) national norms assume that some growth will occur over the summer but compensatory education students' performance remains constant over this same period, thereby resulting in a gap between compensatory education students and the national norms, (Hill, 1979); 2) some off-level testing of one or two levels below grade level did take place during Fall, 1979 which may have caused deviations in scores from those that might have been obtained from on-level testing;[1] and 3) selection for participation was done on the basis of test scores and teacher judgment, with teacher judgment holding more weight initially than in the subsequent years owing to fact the 1979-80 school year was the first year of introduction of CAT after many years of use of a criterion referenced testing program.

This study represents the first attempt in Saginaw to look at sustained effects of both Chapter I participants and former participants. Based on this experience, it is apparent that a number independent variables need to be controlled in any subsequent studies. These variables include the following: variations among Chapter I program sites; history of students; participation in other compensatory education programs; better identification of

---

[1]The majority of the off-level testing was one level below the on-level testing. The norms supplied by the test publisher did accommodate as much as two levels off in the norming process. However, the federal regulations as interpreted by the Michigan Department of Education advised a single level removed from on-level testing. After the initial experience with functional level testing during the Fall of 1979, it was decided that all subsequent CAT testing would be on-level.

"false positives" (those students whose scores exceed the cut-off point for Chapter I eligibility while their actual functioning levels may be much lower); summer vacation effects; etc. Hopefully, this school district and others, with help from the Michigan State Department of Education will do other studies to more definitively determine the sustained effects of Chapter I participation.

It was found that the academic achievement of Saginaw's compensatory education population is associated positively with the amount of continuous time spent in the Chapter I STP program. When compensatory education services are interrupted, these students lose academically in both subject areas either due to not having a chance to further consolidate learnings or because the measurement of their achievement showed incorrectly high levels of attainment. The interrupted group, however, showed a smaller drop in reading than in mathematics possibly due to the fact that reading skills are more likely to be dealt with on a regular basis outside the school environment. Consequently, incidental learning of reading related skills is more likely to take place.

A great deal of information has been shared with the reader thus far. At this point an effort will be made to summarize this information and formulate concluding statements.

SUMMARY AND CONCLUSIONS

A study of the long-term sustained impact of the Chapter I Supplemental Teacher Participation (STP) program on third grade participants during the 1979-80 school year was undertaken. A total of 256 students from an original group of 335 third grade STP participants who were pre- and post-tested during the 1979-80 school year were classified into one of four categories of participation. The participation categories were the following: one year, two year continuous, three year continuous, and two year interrupted.

Two different standards were used to gauge observed growth of groups in each category. The first growth equal to or exceeding normal growth or, in other words, sustaining normal growth levels or exceeding them. All four category groups exceeded the standard of "normal growth" in both academic areas except for the two year interrupted group in mathematics.

The second standard required growth equaling or exceeding the growth of the three year continuous STP group. The three other groups failed this standard in both subjects with the exception of the two year continuous group in mathematics.

A number of conclusions come from a review of the results.

1. Of the 117 pupils who tested out at different testing points, a total of 87.2% (102 of 117) sustained the effects of the STP program's impact:
   - 20.5% for at least one year (21 of 102)
   - 79.5% for at least two years (81 of 102)

2. For the pupils who had to stay in Saginaw's Chapter I program for three years (54.2%:139 of 256), their test results evidenced percentage gains in excess of "normal growth" over the three year period (23.3% and 10.7% in reading and mathematics respectively).

3. Saginaw's Chapter 1 program shows larger gains for three year continuous participation than for one or two year continuous or two year interrupted participation.

4. Saginaw's compensatory education program evidenced:

   - The largest magnitude of NCE total net gain in mathematics.
   - The greatest increase over and above "normal growth" in reading.

RECOMMENDATIONS

Listed below are a series of recommendations based on the findings of this study. These recommendations are offered in an effort to improve the long-term implementation and impact of the Chapter I STP program.

1. Definite plans for any future sustained effects study should be outlined in advance to ensure that accurate longitudinal records of Chapter 1 participants are available. Such records would yield more comprehensive accounting of all aspects of participation (past history of participation, longitudinal test file linkage with unique student numbers for each student, determination of research/evaluation questions of interest, necessary testing points to answer questions posed, etc.) and ultimately make possible better understanding of the nature of any sustained effects through better controls.

2. Attention could be given to another set of grade levels to see if the same trends also hold with other aged participants. The inclusion of a sixth grade cohort in a three year longitudinal study seems to be a workable possibility because of adequate testing points to make comparisons between participants and non-participants.

3. Special study of higher scoring STP participants who test-out but still seem in need of compensatory education services in subsequent years should be planned for and undertaken. Such a study would focus on the following questions.

   - Are there higher achievers (relatively speaking) really showing high scores because of a large error component to their test scores due to some testing related factor (e.g., guessing, improper test administration, etc.)?

   - Do these higher achieving students seem to possess any readily observable characteristics that set them apart as a group?

   - Do these students appear more frequently in certain buildings rather than others?

- How much and what type of additional help should this group of pupils be given (if they can be identified) to foster lasting achievements?

- Can an alternate cut-off criterion score be established to ensure fewer false positives?

BIBLIOGRAPHY

Burton, R. Discussion: Underlying Assumptions and Resulting Biases. In G. Echtermacht (Ed.), New Directions For Testing and Measurement: Measurement Aspects of Title I Evaluations, San Francisco: Jossey-Bass, Inc., 1980.

Echternacht, G. Title I Evaluation and Reporting System: Development of Evaluation Models. In G. Echtermacht (Ed.), New Directions For Testing and Measurement: Measurement Aspects of Title I Evaluations, San Francisco: Jossey-Bass, Inc., 1980.

Hill, P. Summer Drop-Off and the Effectiveness of Compensatory Instruction. (Paper prepared for the National Conference on Urban Education, held in St. Louis, Missouri, July 10-14, 1978), St. Louis, MO: CEMREL, Inc., 1979.

Linn, R. Discussion: Regression Toward the Mean and the Interval Between Test Administration. In G. Echtermacht (Ed.), New Directions For Testing and Measurement: Measurement Aspects of Title I Evaluations, San Francisco: Jossey-Bass, Inc., 1980.

Mullin, S. and Summers, A. Is More Better? The Effectiveness of Spending on Compensatory Education, Phi Delta Kappan, 1983, 64 (5), 339-347.

Roberts, A. Regression Toward the Mean and the Regression-Effect Bias. In G. Echtermacht (Ed.), New Directions For Testing and Measurement: Measurement Aspects of Title I Evaluations, San Francisco: Jossey-Bass, Inc., 1980.